

### REMARKS

Claims 1-11 and 13-40 are pending, with claims 1, 5, and 9 in independent form.

Applicants thank the Examiner for indicating that, if rewritten in independent form, claims 16-20 would be allowable over the prior art of record. Although Applicants have not elected to do so in the present reply, Applicants reserve the right to rewrite these claims in a future communication.

Claims 1, 2, 4, 9, 10, 13-15, 21, 22, 24-27, 29, 32, 34, 35, 37, 38, and 40 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Augusto (U.S. Patent Application Publication No. US 2002/0101895, "Augusto"). Applicants respectfully disagree with these claim rejections for at least the following reasons.

Independent claim 1 covers radiation detectors "that detect[] radiation according to a predefined spectral sensitivity distribution that exhibits a maximum at a predefined wavelength  $\lambda_0$ " and that include an active region featuring "a plurality of functional layers, at least two of said functional layers having different band gaps, each one of the functional layers being implemented to absorb at least some of the radiation, and wherein at least a part of said functional layers absorbs radiation in a wavelength range that includes wavelengths greater than the wavelength  $\lambda_0$ ." The Action alleges that Augusto discloses such radiation detectors, and refers in particular to the disclosure in paragraphs 0175-0191 of Augusto (Action at page 3).

Augusto fails to either disclose or suggest a radiation detector for detecting radiation according to a predefined spectral sensitivity distribution, as claim 1 requires. Instead, Augusto merely discloses the construction of multi-spectral image sensors that can detect light in a variety of different wavelength bands. Augusto adjusts the wavelength band for a specific layer in his device by using different layer configurations; he states that "[d]ifferent ranges of wavelengths translate into different photon energies, which in turn may require different Quantum Well designs" (Augusto, par. 0179). Augusto appears to make no attempt to structure a multi-spectral sensor such that it detects radiation "according to a predefined spectral sensitivity distribution." Doing so would likely require first identifying a target spectral sensitivity distribution, and then

specifically tailoring not only the wavelength bands of the various detection layers in his device, but also adjusting the *efficiencies* of each of the detection layers to match the target spectral sensitivity distribution. Applicants have been unable to find any disclosure in Augusto relating to such steps.

Absent such disclosure, it follows that Augusto also does not structure his devices so that “at least a part of said functional layers absorbs radiation in a wavelength range that includes wavelengths greater than the wavelength  $\lambda_0$ ,” where  $\lambda_0$  is “a maximum at a predefined wavelength” of the spectral sensitivity distribution, as claim 1 requires.

Accordingly, Applicants submit that Augusto fails to disclose or suggest the radiation detectors covered by claim 1. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b).

Independent claim 9 covers radiation detectors “that detect[] radiation in accordance with a predefined spectral sensitivity distribution that exhibits a maximum at a predefined wavelength  $\lambda_0$ ,” where “disposed after said active region is a filter layer structure ... [that] determines the short-wave side of said detector sensitivity in accordance with said predetermined spectral sensitivity distribution by absorbing radiation in a wavelength range that includes wavelengths smaller than  $\lambda_0$ .” The Action alleges that such radiation detectors are disclosed in Augusto, and points in particular to paragraphs 0175-0191 (Action at page 4).

As discussed in connection with claim 1 above, however, Applicants have been unable to find any disclosure in Augusto relating to configuring his multi-spectral detectors according to a predefined spectral sensitivity distribution. Instead, Augusto appears to merely disclose processes whereby the bandgaps of different detection layers can be selected for sensitivity in a particular wavelength band. But Augusto does not appear to disclose or suggest further tailoring the detection efficiencies of multiple layers of his devices to match a target spectral sensitivity distribution as claim 9 requires. Moreover, owing to this lack of disclosure, Augusto further fails to disclose structuring his devices so that a filter layer structure “determines the short-wave side of said detector sensitivity in accordance with said predetermined spectral sensitivity distribution

by absorbing radiation in a wavelength range that includes wavelengths smaller than  $\lambda_0$ ,” as claim 9 requires.

Accordingly, Applicants submit that the radiation detectors covered by claim 9 are neither disclosed nor suggested by Augusto. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 9 under 35 U.S.C. § 102(b).

Claims 2, 4, 10, 13-15, 21, 22, 24-27, 29, 32, 34, 35, 37, 38, and 40 each depend from one of claims 1 and 9, and are therefore patentable over Augusto for at least the same reasons discussed above. Accordingly, Applicants further respectfully request reconsideration and withdrawal of the rejections of these claims under 35 U.S.C. § 102(b).

Claims 3, 5-8, 11, 23, 28, 30, 31, 33, 36, and 39 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Augusto in view of Major et al. (U.S. Patent No. 5,689,123, “Major”). Applicants respectfully disagree with these rejections for at least the following reasons.

Claims 3, 23, 28, and 30 each depend from claim 1, which is patentable over Augusto as explained above. Notwithstanding any disclosure in Major relating to the additional limitations of these claims, and without conceding that the proposed combination of Augusto and Major is proper, Applicants note that Major does not cure Augusto's deficiencies with regard to claim 1 at least because Major does not disclose or suggest radiation detectors “that detect[] radiation according to a predefined spectral sensitivity distribution that exhibits a maximum at a predefined wavelength  $\lambda_0$ ” that include an active region featuring “a plurality of functional layers ... wherein at least a part of said functional layers absorbs radiation in a wavelength range that includes wavelengths greater than the wavelength  $\lambda_0$ ,” as claim 1 requires. Accordingly, Applicants submit that claim 1 is patentable over Augusto and Major.

By virtue of their dependence from claim 1, each of claims 3, 23, 28, and 30 is also therefore patentable over Augusto and Major, and Applicants respectfully request reconsideration and withdrawal of the rejections of these claims under 35 U.S.C. § 103(a).

Claim 11 depends from claim 9, which is patentable over Augusto as explained above. Notwithstanding any disclosure in Major relating to the additional limitations of claim 11, and without conceding that the proposed combination of Augusto and Major is proper, Applicants note that Major does not cure Augusto's deficiencies with regard to claim 9 at least because Major does not disclose or suggest radiation detectors "that detect[] radiation in accordance with a predefined spectral sensitivity distribution that exhibits a maximum at a predefined wavelength  $\lambda_0$ ," with "a filter layer structure ... [that] determines the short-wave side of said detector sensitivity in accordance with said predetermined spectral sensitivity distribution by absorbing radiation in a wavelength range that includes wavelengths smaller than  $\lambda_0$ ," as claim 9 requires. Accordingly, Applicants submit that claim 9 is patentable over Augusto and Major.

By virtue of its dependence from claim 9, claim 11 is also therefore patentable over Augusto and Major, and Applicants respectfully request reconsideration and withdrawal of the rejection of claim 11 under 35 U.S.C. § 103(a).

Independent claim 5 covers radiation detectors "that detect[] radiation in accordance with the predefined spectral sensitivity distribution of the human eye, which exhibits a maximum at the wavelength  $\lambda_0$ ," featuring a semiconductor body that "contains at least one III/V semiconductor material." The Action alleges that Augusto discloses nearly all of the limitations of claim 5, but admits that Augusto does not disclose a semiconductor body that contains at least one III/V semiconductor material (Action at page 6). However, the Action goes on to allege that Major discloses the use of such materials in optoelectronic devices, and that it would have been obvious to combine Augusto and Major to yield the detectors covered by claim 5 (Action at pages 6-7). Applicants respectfully disagree for at least the following reasons.

Without addressing or conceding the Action's arguments regarding the disclosure in Major and the propriety of combining Augusto and Major, Applicants note that claim 5 is even more specific than claims 1 and 9 discussed above, and covers radiation detectors "that detect[] radiation in accordance with the predefined spectral sensitivity distribution of the human eye." Augusto fails to either disclose or suggest a radiation detector for detecting radiation according to *any* predefined spectral sensitivity distribution – including the spectral sensitivity

distribution of the human eye. Instead, Augusto merely discloses the construction of multi-spectral image sensors that can detect light in a variety of different wavelength bands, and he adjusts the wavelength band for specific layers in his device by using different layer configurations.

But Applicants have been unable to find any disclosure in Augusto relating to, for example, further tailoring not only the wavelength bands of the various detection layers in his device, but also adjusting the efficiencies of each of the detection layers to match the spectral sensitivity distribution of the human eye. A multi-spectral detector that is merely capable of detecting light in the visible region of the spectrum does not detect radiation “in accordance with the predefined spectral sensitivity distribution of the human eye.” Additional configuration of such a detector is required so that the individual sensitivities of the detection layers that correspond to the different wavelength bands match the sensitivity of the human eye in corresponding wavelength bands. Applicants have been unable to find any evidence suggesting that Augusto configures his devices in this manner. Further, Major does not appear to cure the deficiencies of Augusto, at least because Major also apparently fails to disclose a detector “that detects radiation in accordance with the predefined spectral sensitivity distribution of the human eye.”

For at least the foregoing reasons, Applicants submit that claim 5 is patentable over Augusto and Major, and respectfully request reconsideration and withdrawal of the rejection of claim 5 under 35 U.S.C. § 103(a). Claims 6-8, 31, 33, 36, and 39 each depend from claim 5, and are therefore patentable over Augusto and Major for at least the same reasons. Accordingly, Applicants further respectfully request reconsideration and withdrawal of the rejections of these claims under 35 U.S.C. § 103(a).

In view of the foregoing, Applicants ask that the application be allowed.

Canceled claims, if any, have been canceled without prejudice or disclaimer. Any circumstance in which Applicants have: (a) addressed certain comments of the Examiner does not mean that Applicants concede other comments of the Examiner; (b) made

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arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims; or (c) amended or canceled a claim does not mean that Applicants concede any of the Examiner's positions with respect to that claim or other claims.

No fees are believed to be due. Please apply any charges or credits to Deposit Account 06-1050, referencing Attorney Docket No. 12406-0213US1.

Respectfully submitted,

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